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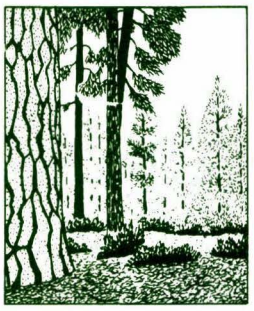
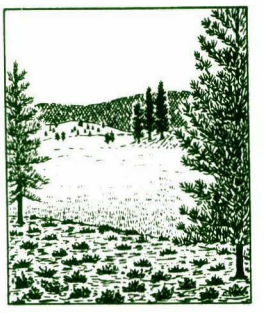


FOREST RESEARCH NOTES

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
GEORGE M JEMISON, DIRECTOR

U.S. DEPARTMENT OF AGRICULTURE – FOREST SERVICE



No. 112 September 5, 1956

HUMIDITY CONTROL UNIT FOR GREENHOUSES AND PROPAGATING BEDS

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Control of humidity is one of the essential factors in vegetative propagation of pine. Several different control units for mist-type humidifiers have been tried at the Institute of Forest Genetics, but most of them proved unsatisfactory. Some were not sensitive enough; that is, they permitted too wide a range of humidity between the time the mist was turned off and when it started again. When this happens, the plant material dries; and then, even though drying occurs only occasionally, the cuttings will not produce roots. Other control units, although reasonably accurate, have to be cleaned at least once a week to keep algae and mold from collecting on the sensitive parts of the instrument. If they are not kept clean, the instrument becomes ineffective.

This note describes a simple, inexpensive humidity control unit that has proved entirely satisfactory (fig. 1). Its essential parts are a sensing unit and circuit breaker mounted on a metal bracket within the propagating bed. The unit receives 24-volt current from a transformer. This low-voltage current actuates a 110-volt relay, which in turn sets in motion a solenoid valve that controls the mist. All 110-volt apparatus is located outside the propagating bed in a dry, protected spot.

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Most of the materials used for the control unit we built at the Institute were already on hand. Only the sensing unit was purchased, this being a set of hygrograph hairs (A). The circuit breaker (B) is a discarded set of automobile breaker points. The mounting bracket was made of a piece of 1/4-inch aluminum plate (C), 2 inches wide by 8-1/2 inches long, ~~sol-~~ attached ~~dered~~ to a brass plate 1/16 inch thick and 2-3/4 by 3-1/2 inches in size (D). At the lower end of the aluminum plate is a brass bolt, nut, and spring (E) used to adjust the tension of the hygrograph hairs. Other parts are a short piece of brazing rod (F), a piece of plastic or some other insulating material (G), and a few brass machine screws.

The only tools needed to construct the control unit are a hacksaw, hand drill, machine screw tap, screwdriver, file, and soldering iron.

In operation, the hairs elongate as the humidity increases and allow the breaker points to open. This cuts off the electric current and the valve that controls the mist. As the humidity decreases, the hairs contract, the points close, and then the current flows and starts the mist again. The unit can be regulated by adjusting tension on the hairs so that the humidity is held at practically any percentage range desired. For propagating pine cuttings, it is adjusted to maintain from 70 to 80 percent humidity.

Maintenance is practically negligible. It would be well to clean the hairs and dress the points every six months to insure positive performance. At the Institute, however, the unit has been operated for several years and only cleaned once.

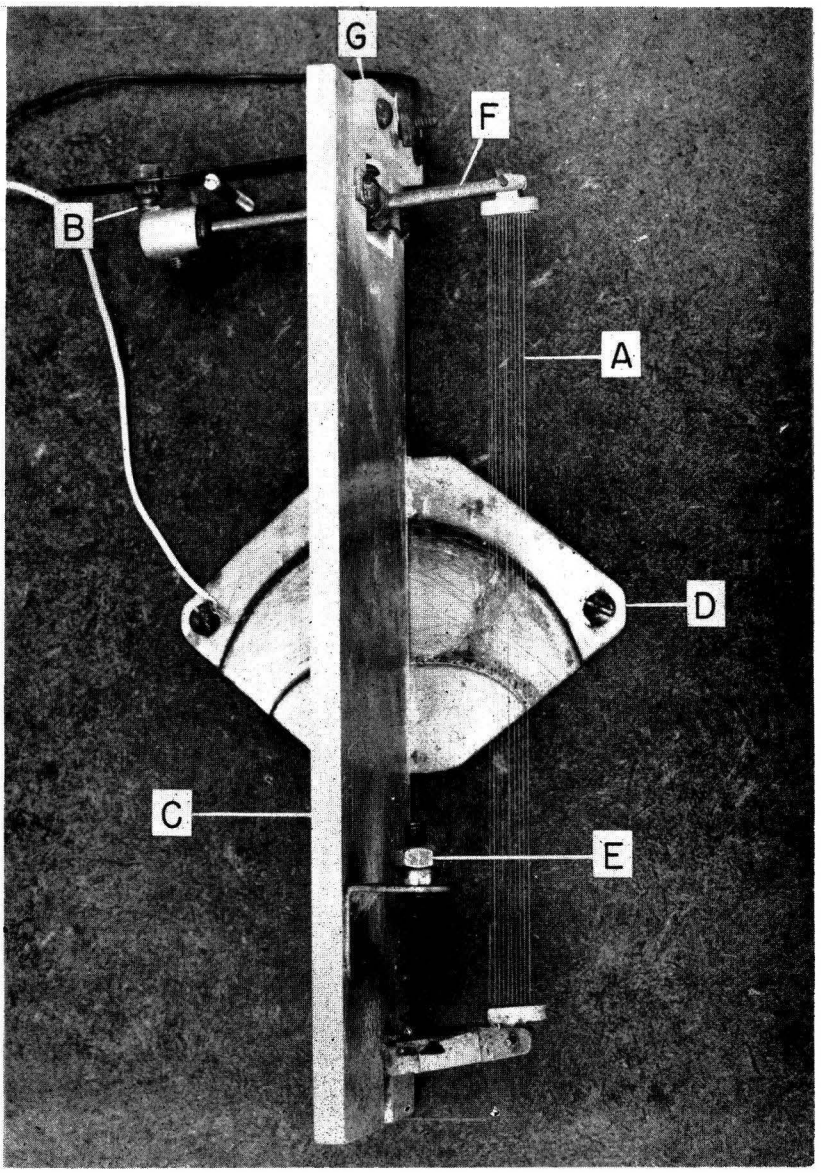

Figure 1.--Humidity control unit for greenhouses and propagating beds.